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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,074	03/17/2005	Hugues Van Den Bergen	2005_0442A	2787

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WASHINGTON, DC 20006-1021

EXAMINER

CHIMIAK, EMILY ANN

ART UNIT	PAPER NUMBER
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1791

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,074	Applicant(s) VAN DEN BERGEN ET AL.	
	Examiner Emily Chimiak	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 22, 23-26, 28, 30, 33-35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. (US 4104427) in view of Van Den Bergen '826.

As to claims 22 and 34, Nolte et al. discloses coating plastics with embedded intumescent material on glass panes, and providing the same material as a curable adhesive layer between the panes in order to provide a transparent fire resistant layer. (col. 3 lines 23-25, 60, col. 4 lines 8-19 and 25-26). Nolte et al. does not disclose the radiation curable composition. However, Van Den Bergen '826 discloses a transparent flame retardant coating that is radiation curable and that may be used with any substrate. Van Den Bergen '826 discloses that the intumescent material such as that proposed by Nolte et al. is inferior because additives can migrate through the coating to the surface which can lead to blooming and because additives may discolour the composition (page 2 lines 1-5, page 26 lines 12-13, page 45 lines 4-5). To prevent these drawbacks, Nolte et

al. must form a protective stratum and must compromise between light transmission before exposure to fire and fire resistance (col. 3 lines 67-col. 4 line 2). The coating disclosed by Van Den Bergen comprises at least one radiation curable polymer precursor having polymerizable ethylenically unsaturated functions providing flame retardant properties to the cured composition (page 11 lines 1-5). It is noted that the composition disclosed by Van Den Bergen preferably comprises an acrylate moiety (see page 13, lines 35-36). It would have been obvious at the time of invention to one of ordinary skill in the art to apply the coating disclosed by Van Den Bergen in the lamination procedure disclosed by Nolte et al. to avoid the aforementioned disadvantages of intumescent additives separate from the resin. One would appreciate using the preferred composition of Van Den Bergen, i.e. one would appreciate including an acrylate moiety.

As to claims 23-26, Van Den Bergen '826 discloses that the radiation curable polymer precursor provides flame retardant properties to the cured composition, comprises one or more radiation curable phosphorus containing polymer precursors which have, at the chain ends or laterally along the chain, acrylic, methacrylic or vinyl groups, wherein the radiation curable polymer comprises phosphorus containing urethane acrylate, and wherein the composition contains a radiation curable monomer which is phosphorus containing to contribute to flame retardant properties of the cured composition (see the above rejection of claim 1).

As to claim 30, Nolte et al. discloses including titanium oxide as a coating material when aluminum phosphate is used (col. 4 lines 55-58). However, Nolte et al. as modified does not disclose using tin oxide in the general embodiment. Van Den Bergen '826 discloses including magnesium oxide, i.e. an additive that is not a copolymerizable, non reactive, inorganic

compound contributing to the flame-retardant properties (page 46 line 22). It would have been obvious to one of ordinary skill in the art at the time of invention to include magnesium oxide in the coating as taught by Van Den Bergen '826 for improved flame retardant properties.

As to claim 33, Nolte discloses a flame-retardant light-transmitting laminate (abstract).
As to claims 35 and 36, the rejection of claim 25 is relied on.

5. Claims 28, 29, 36, 38 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. and Van Den Bergen '826 as applied to claim 7 above, and further in view of Takasi et al. (WO 98/36325).

As to claims 28, 29 and 36, Nolte et al. does not disclose methacrylic acid as a non flame retardant monomer in the coating. However, Van den Bergen discloses that the phosphorus content must be chosen according to its end use and discloses that the polymer precursors of the invention can be copolymerized by reacting with other monomers (page 18 lines (page 1 lines 25-29, page 15 lines 9-10 and page 18 lines 22-24). Takasi et al. discloses that (meth)acrylate may be added as necessary depending on the particular application and such that the glass transition temperature is not too low and is not excessive (page 16 lines 5-10 and 24 and page 20 lines 22-30). It would have been obvious to one of ordinary skill in the art at the time of invention to include a proportion of methacrylic acid as taught by Takasi et al. in the coating disclosed by Nolte et al. to modify the composition depending on the standard of fire resistance and the physicochemical and mechanical properties desired.

As to claim 38, Nolte et al. does not disclose a coating comprising 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide. Van Den Bergen '826 discloses the flame retardant polymer precursor comprising 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide as an additional flame retardant additive (page 46 line 13). It would have been obvious to one of ordinary skill in the art at the time of invention to include 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide as taught by Van Den Bergen '826 in the coating disclosed by Nolte et al. in order to improve the flame retardant properties.

As to claim 40, in one embodiment, Nolte discloses including hydrated alkali metal silicates because they adhere well to glass, but does not disclose incorporating it in a radiation curable composition (col. 3 lines 41-45). Van Den Bergen '826 discloses adding silicate derivatives to improve flame retardant properties (page 46 line 23). It would have been obvious to one of ordinary skill in the art at the time of invention to include hydrated alkali metal silicates as taught by Van Den Bergen '826 in the coating disclosed by Nolte et al. to improve flame resistance and adherence.

As to claim 41, Nolte et al. teaches curing in a furnace. However, Van Den Bergen '826 teaches that irradiation is an equivalent curing method to thermal heating (page 1 lines 13-15). It would have been obvious at the time of invention to one of ordinary skill in the art to cure with irradiation as taught by Van Den Bergen '826 in the procedure disclosed by Nolte et al. because it is an equivalent curing method to heating.

As to claim 42, the rejection of claim 19 is relied on.

6. Claim 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. in view of Vollkommer et al. (US 4128709).

Nolte et al. as applied to the rejection of claim 1 above is relied on. It is noted that Nolte et al. discloses employing a hydrated metal salt and protective plastics layer as the flame resistant layers (col. 3 lines 30-33 and col. 4 lines 13-20). Nolte et al. does not disclose the radiation curable composition or a halogen containing radiation curable monomer. However, Vollkommer et al. teaches replacing the protective plastics layer and oxides with radiation-curable pentabromobenzylacrylate to prevent the oxides from chalking out of the coating and because pentabromobenzylacrylate has more fire-retardant action. (col. 1 lines 62-67, col. 2 lines 8-11, col. 5 lines 34-35 and col. 6 lines 8-9 and 22-24). It would have been obvious at the time of invention to one of ordinary skill in the art to use a composition comprising pentabromobenzylacrylate as the flame retardant layer as taught by Vollkommer et al. because it is more effective than the flame retardant layer disclosed by Nolte et al. and because it will not chalk out of the coating.

7. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. and Van Den Bergen '286 as applied to claim 1 above, and further in view of Takahashi (US 4126593) and Wu et al. (US 5460872).

Nolte et al. as modified by Van Den Bergen discloses a coating comprising a diluent and inorganic oxides (flame retardant) that are surface treated to improve their compatibility with the polymers to which they are added, but does not disclose that the inorganic oxides are nanoparticles that are functionalized with acrylate or methacrylate functions (page 2 line 3, page

40 lines 34-37 and page 46 lines 29-31). However, Takahashi teaches coating an ester onto inorganic hydroxide powder to eliminate silver streaks that form because the uncoated powder is hygroscopic (col. 3 lines 2-3 and col. 4 lines 6-7, 17-20 and 45). Wu et al. teaches that emulsions comprising 0.01-0.1 micrometer particles of methacrylates have several advantages over conventional dispersions of methacrylates, including better transparency (col. 1 lines 57-60 and col. 2 lines 27-28 and 45-46). It is noted that the advantage of dispersing small particles applies to any emulsion. It would have been obvious at the time of invention by one of ordinary skill in the art to use nanoparticles coated with methacrylate as taught by Takahashi and Wu et al. in the composition disclosed by Van Den Bergen to produce a transparent coating for the lamination method disclosed by Nolte et al.

Response to Arguments

3. Applicant's arguments filed 10/12/2007 have been fully considered but they are not persuasive.

The argument regarding Nolte is not commensurate with the scope of the claims, which do not require that the intumescent material directly contacts the glass panes but merely recites that the intumescent material is somewhere between the glass (see claim 22 line 6 in Nolte). It is noted that Nolte is not relied on to teach radiation curable materials.

As to the argument regarding Van Den Bergen and Volkommer, neither are relied on to teach flame retardant materials as layers in glass lamination. It is noted that Nolte teaches that contact between certain intumescent materials such as hydrated metal salts may deteriorate glass sheets (col. 4 lines 5-10 in Nolte). However, the reference does not teach that all intumescent materials inherently deteriorate glass. At the time the disclosure of Nolte was published, 1978,

alternate intumescent materials would be proposed that would not suffer the same drawbacks. In any event, the intumescent material of Nolte et al. as modified by Van Den Bergen and Vollkommer et al. does not contact the glass in the embodiment of Nolte et al. relied on wherein a protective coating is applied to each glass pane (see Nolte et al. col. 4 lines 14-16).

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily Chimiak whose telephone number is (571)272-6486. The examiner can normally be reached on Monday-Friday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)272-6486. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

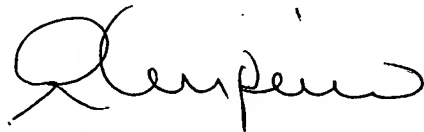
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